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INDUSTRIAL DEVELOPMENT OF INDONESIA

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By **Ir. ANONDO,**
Ministry of Basic Industry and Mining

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INDUSTRIAL DEVELOPMENT OF INDONESIA

by

Ir. Anondo

MINISTRY OF BASIC INDUSTRY AND MINING

CHAPTER I

HISTORICAL REVIEW OF INDUSTRIAL DEVELOPMENT PROGRAMMES

- 1/. Postwar industrial development programmes contained two main features:
First: Programmes such as the Kasime-Plan and Urgency-Programme (1952-55) were considered as stages to reach full industrialization and were based upon conditions of the existing industrial structure which is mainly oriented towards an agricultural base and to the importation of industrial raw materials.
Second: The following Plans: the Five Year Plan (1956-60) and the Overall Development Plan (1961-68) are aimed at the idea of opening new lines of productive activities and primarily at the desire of self-support, while in the meantime establishing the foundation for a radical change in the traditional pattern of the economy towards a modern industrialized structure through a programme of industrialization based on the availability of the natural resources of the country.
- 2/. In developing the existing industrial structure gradually and through stages, the application of science and technology is aimed at improving the methods of production as well as introducing new machineries and equipment, to step up productivity and to increase efficiency. Even if no radical changes were envisaged, the impact upon simple and traditional ways of production was quite substantial and in some cases even disturbing because the new applied technology was unknown before. Technological and research centres are helping new enterprises to meet obstacles facing the industries in their first steps towards full mechanization.
- 3/. When, however, projects in basic industries have to be planned and executed under the Five Year Plan and the Overall Development Plan, such as oil refineries, fertilizer plants, iron and steel industries, aluminium plants, tin-smelter and nickel refining plants, technological problems arise which the existing technological as well as research centres are unable to cope with, since highly specialized knowledge and well qualified experts are required. The lack of adequate technological and research facilities forced the country to rely heavily on centres abroad in which case communicational problems arose. In this connection the need for continuous exchange of technical know-how, quick exchanges of personnel, samples for laboratory and industrial testing, became apparent. Other difficulties regarding the preparation of drawings, process sheets, lay-outs, determining location and the exact site of the plant, have to be overbridged in which cases usually no comparative materials are available to make up the right judgment and proper evaluation.
- 4/. The need to combine such experience with the progress of technological know-how is of primary importance for developing nations in undertaking now big projects where advanced technological knowledge and skill are considered most essential. Within this framework of pooling experience and advanced technology, emphasis should be put upon the application of modern science and technology under the prevailing conditions and circumstances where less developed countries have to cope with, among others, the tropical climate, inadequate facilities, the lack of research opportunities and adequate funds as well as expertise personnel.

CHAPTER II

THE TECHNOLOGICAL IMPACT ON SMALL AND MEDIUM SCALE INDUSTRIES

- 5/. The Loan Mechanization Programme's aim is to mechanize traditional ways of production, which relied heavily upon manual labour and usually were carried out in cottage, home or small-scale industrial enterprises with inadequate tools and limited capital. The introduction of electrical power, modern machineries, up to date equipment, new processes and methods, have stepped up capacity to such a large extent that managerial problems arose as a consequence of this process of mechanization, such as the need for skilled labour and well-trained supervisory personnel, the different requirements for industrial raw materials and spare parts, the urgent need for auxiliary services to help the enterprises when facing mechanical trouble, the radical changes in lay-out, in the methods of processing, the level of production, the changes in the finished products, besides problems of marketing the goods and acquiring the required capital for investment as well as for running the enterprises. Simple technological improvements can give favourable results and small enterprises can more easily face competition even against big firms, since the quality of the products can be better maintained at a lower cost of production.
- 6/. The Central Production Units (Induks) have been planned to service existing enterprises within a certain locality with the intention of processing available industrial raw materials, which can be done technologically better and at a lower cost, to carry out the finishing stage of production, to disseminate technical know-how which cannot be acquired elsewhere, to train local labour and skilled personnel in various professions and at various levels, to undertake laboratory tests and experiments, and to service equipment and machinery for maintenance and repair. Besides some failures because of the competitive market and locational factors, success has been achieved and the small enterprises have gained the advantage of a regular supply of a good quality of industrial raw materials, a continuous market for its semi-finished products, an improvement of its end-products, a better utilization of its available means of production, which means substantial technological improvement upon its traditional ways of production and operation. Some of these Central Units became model-plants or experimental units to be duplicated by others.
- 7/. The Research and Training Institutes have basically two objectives : carrying out industrial research, especially applied research, which mainly comes down to experimentations on a laboratory or pilot plant scale; training technical personnel from basic short-term courses to more advanced technical training up to the level of a complete undergraduate college study. Besides these objectives, they disseminate technical information to the public and are testing commercial products to ensure that goods are according to standards and required qualifications for export as well as for domestic consumption. Through a programme of rehabilitation and expansion of these Institutes with the assistance and cooperation of international agencies, they are now covering in their daily task the various fields of industrial activities such as textiles, batik printing, food processing, glass and ceramics, leather works, rubber products, besides other branches in the broad field of chemical and mechanical industries. They are forming the actual link between science and technology on the one hand and the practical needs of the industries on the other hand; they have served the industrial enterprises in improving their technical standards and have contributed to the upgrading and technical training of their personnel in the various levels of their professions.
- 8/. The State Industrial Bank (Bank Industri Negara) more exactly an "Industrial Finance Corporation", has been the main financial institution to finance development projects under the Urgency Programme and the Five Year Plan,

through the grant of credits with the guarantee of the Government, or from its own sources, besides participating through shares in new ventures with private partners. Its activities have not been limited to mere banking and finance; it owns factories, supervises the implementation of industrial projects, promotes the growth of new enterprises, takes over the Board of Management, renders consultant services and advice and in many cases it became the "trouble shooter" to get things done or to get the final decision on an important matter. The manifold functions of the Bank have contributed to the establishment of new lines of production and to the increased capacity of production of various industries. The projects undertaken are of a medium scale where the application of science and modern technology is the most advanced; they are adapted to the prevailing conditions, taking into consideration many existing factors.

- 9/. The National Planning Bureau drafted the first Five Year Plan which was adopted by Parliament and in its implementation was adjusted yearly to the annual budget of the Government. During the 5 year period, primarily pre-investment activities were carried out, as preliminary and complete surveys, choosing the right technical advisors and consultants, negotiating the supply of raw materials as in the case of natural gas for a fertilizer project, choosing the plant-site, acquiring the land, making up the technical drawings, design and plans, appointing the contractors, studying the availability of raw materials and marketing conditions. Much of the work has to be done with outside assistance and with heavy reliance upon foreign resources. It can be stated fairly that the Five Year Plan covered mainly (1) the pre-investment stage for the implementation of new basic industrial lines to be executed by the following Plan (2) the partial execution of modern medium scale industrial plants (3) the extension of already existing industrial programmes in the field of small industries and (4) the rehabilitation of existing mining activities and exploratory work in mineral resources which again formed the basic preliminary work for the next Plan.
- 10/. The Overall Development Plan was drafted by the National Planning Council (Depernas) and was adopted by the Provisional People's Congress (MPRS) as the highest political body of the country, to be executed by the present Administration under the President. The main assumption of the Plan was based on the condition that the B-Projects, those earning the necessary foreign exchange, for instance - petroleum, rubber and tin, should finance the A-Projects which are foreign exchange saving, self- as well as non-self liquidating projects, or need foreign exchange financing. Despite the lack of detailed programming, a definite set of priorities, coordination and synchronisation in the implementation of the economic over-all Plan has provided for a radical change of the present economic structure towards a full scale industrialization programme on a modern basis by laying the foundations for the basic and heavy industries which rely heavily on the availability of the natural resources of the country, while tackling the consumers' goods industries for the urgent needs of food, clothing and shelter. Furthermore, it should be noted that this Plan has given special attention to the field of research, especially research which is directly connected with the implementation of the industrial and mining projects. It provides the planning of research institutes in the field of chemicals, physics, metallurgy, electronics, geology and mining, aerial survey, telecommunications, etc. The Ministry for National Research has set up Research Councils covering Industry and Technology and this enlarges the previous programmes of Industrial Research and Training Institutes to the broad fields of basic as well as applied research related to the development of the country. The direct impact upon the development projects will be apparent in the applied research carried further to experimentations, product development and pilot projects.

CHAPTER III

THE NATIONALIZED INDUSTRIES

- 11/. When at the end of 1957 and the beginning of 1958, for political reasons, the Indonesian Government took over approximately 300 Dutch-owned industrial enterprises, it was confronted with numerous managerial problems in the field of production, financing, industrial relations and marketing as well as organisational aspects of management. These problems were partly internal and partly external, varying widely from one enterprise to the other.
- (a). Since most of the factories are old, there is usually no overall integration of the plant lay-out. The individual work is done independently without taking much into consideration as to the sequence of operation and the principle of flow, nor is there any consideration of minimum distance. Since every plant has its own characteristic features of lay-out, improvements can only be made on a case by case basis, which is now under way. Operations of material handling are still carried out on a manual basis; they make very intensive use of labour and, therefore, increase operational cost, especially when wages are going up which is now the trend. Because most of the equipment and machineries of the plants are old, extra care has to be given to proper maintenance; a small disturbance somewhere can cause a major disaster. Since getting spare parts is an acute problem, much is required from the technical staff to improvise solutions; some shops are forced to produce equipment themselves, which is very costly and time consuming. Processes and methods of production are in many instances out of date, which causes much waste and inefficiency. Because of the limited facilities of the plants product development and research have not been carried out sufficiently. Due to uncertainties in the supply of imported raw materials, not much production planning and scheduling has been done and if there is some scheduling, the work usually lags far behind the projected schedules. Because most of the raw materials and spare parts have to be imported, which depends upon the availability of foreign exchange and import licenses, no adequate stock can be maintained. Only in bigger plants producing standardized articles inspection and quality control have been introduced. Despite above obstacles and deficiencies, much can still be done to improve the methods of production in the nationalized industries and even if radical changes are sometimes opposed by conservative elements, the process of under-taking modern production management has been accelerated by the introduction of training courses on the job and other management courses.
- (b). Problems concerning financial management are also numerous and can only be solved slowly. The centralized financial administration has to be changed and much work has to be done to reform, adjust and decentralize the financial administrative procedure. Most of the enterprises have to set up their own finance department, secure their own operating capital and watch their liquidity position. They have to introduce modern cost-accounting, which has never been used before, and to pay special attention to increased expenses on social securities and rising prices of raw materials.
- (c). Syndicalist movements in the beginning of nationalization were prevented by armed intervention. Management-labour relations under-went drastic change and sharp conflicts previously encountered between management and trade-unions have gradually been transformed into peaceful settlements between the two parties. Special attention has been given to social security, wage incentives, and a better appreciation of the worker's contribution towards production. Industrial relations have been improved and old-fashioned views of control towards the working forces have been replaced by modern tools of personnel management.

- (d). No real marketing problems have been encountered, because of the seller's market position for most of the enterprises. In this connection there were still many problems to be solved on transportation and storage difficulties, price controls, rigid administrative controls on channeling the distribution, changes of marketing institutions, shortages of packing material etc.
- (e) The exodus of Dutch managerial personnel created an acute shortage of competent managerial personnel and only after careful staffing and by replacing them by well qualified and trained personnel, which took two to three years, has the problem been solved.

12/. After three years of experience in dealing with nationalized enterprises, it was considered necessary to amalgamate the various forms of State enterprise into one form of State Enterprise incorporated by law under the basic "Law on State Enterprises". The emergence of this new form of state enterprise under this law has integrated the independent units into one large operation, strengthening their monopoly position and scrutinizing inefficient operation. It has improved specialization, consolidated the various activities and pooled its technical know-how and financial resources.

CHAPTER IV

RECENT EXPERIENCES ON THE PRE-INVESTMENT STAGE

- 13/. The Overall Development Plan has provided for an overall plan covering 335 projects spread over a wide field of activities. It does not, however, provide for programmes based on definite conditions or assumptions, nor does it determine strict priorities on which detailed programming could be based and on the whole remains rather vague in the way of how to implement the Plan. This leaves much room for the executive agencies to make up their own programming. The selection of projects to be implemented has been based upon the availability of sources of financing, especially that of foreign exchange. The availability of credits granted by many countries has become the basis to select the projects. Suppliers' credits usually limit the purchases of the type of equipment, machineries and services involved; this limitation exists in the number of suppliers, the application of technology, the availability and quality of expert knowledge, training facilities, in the prices of the equipment and services, in the selection of the machineries in determining the kind of processes, designs and drawings and in the way of implementing the projects. This way of programming guarantees the source of foreign exchange, but is in many respects unsatisfactory, considered from a technological and economical point of view.
- 14/. When the supply of foreign exchange became scarce owing to the rather heavy terms for the repayment of the loans such as a long grace period, due to balance of payments difficulties, the basis of priority was shifted to the availability of the local currency funds which according to existing procedures, had to be supplied through the regular Annual Budget. As far as possible the projects submitted for approval should be based on priorities outlined by the Central Government.
- 15/. Since experience has shown that the lack of proper programming have forced the executing agencies to be opportunistic in obtaining the necessary funds, an urgent need is felt for better programming, taking into consideration the various determining factors and conditions that will guarantee the success of the Plan. The important aggregates as saving and investment, exports and imports, Government expenditures, the general level of prices and other aggregates that determine national income should be considered in relation to the

various programmes in every sector. If aggregate planning is not related to sectorial planning nor to the programming of the individual projects, the one may offset the other and the end result may be disappointing.

- 16/. In framing the Overall Development Plan the interest of the regions has been considered seriously and the geographical distribution of the projects is mainly based on political justification. With this in mind the location of the projects has been more or less pre-determined without adequate surveys or preliminary investigations or whether a certain location is technically feasible and economically justified. This creates special problems for market-oriented as well as resource-oriented industries.
- 17/. Very important in projecting projects of the nature of resource-oriented industries are the available natural resources, proven reserves and mining quantities which qualitatively have to meet the requirements for processing or manufacturing. The pre-investment work which consists mostly of surveys represents the most important stage since it all depends upon the acquired data whether the project should be set up or is technically not feasible. Sufficient geological surveys should be undertaken before a resource-oriented project can be decided upon and the location and site can be chosen.
- 18/. The collection of engineering data is also of primary importance to decide on the implementation of the project. In the pre-investment stage, all engineering data should already be collected, shifted, systematically arranged and properly evaluated and whenever necessary, laboratory tests should be undertaken. The gathering of engineering data can be done simultaneously with the undertaking of surveys and only if all technical data are collected, the technical feasibility of the project can be decided.
- 19/. The scale of production can be determined according to the availability of the raw materials or according to the market conditions. Both considerations should be calculated to determine the total investment and to know the unit cost of the plant in order to determine further whether the project is sound, profitable or not, quick yielding or self-liquidating. It should make use of economies of scale in the choice of equipment and machinery, in the choice of processes, in the determination of lay-out, in the efficient use of the factors of production, the advantages of the latest technology, and other economies avoiding diseconomies of scale.
- 20/. The cost of the plant only might be small; the cost of the total overheads may exceed the cost of the plant and the whole investment might be very high. The importance of economic and social overheads should not be overlooked, especially if a plant has to be set up in underdeveloped regions which have nothing to offer in terms of facilities such as electrical power, water supply, roads, bridges, harbour facilities, storages, construction services, besides other social overheads such as the availability of labour forces, schools, hospitals, training and recreational facilities, etc.
- 21/. The additional cost of investment for building the infrastructure should ultimately be calculated in the total cost of investment and the indirect benefits by creating other economic activities in relation to the direct benefit of the plant. The cost-benefit ratio is then very difficult to determine since no one knows whether the indirect effects are forthcoming. It is still a political price that should be paid in determining a major project. It is against above background that the economic and social overheads should be judged. For new developing nations it is not purely economic considerations that will determine big or medium scale industrial projects; there are too many other considerations that should be reckoned with in order to be able to interpret the aspirations of the planners and the desire of a nation. Projects that are economically justified, with their risk reduced to a

minimum, can only be undertaken in well-developed regions of the country, usually according to traditional lines, and where technology is well-known and the market is secured. No ventures will be undertaken, no new opening of underdeveloped regions entered upon, no new technologically advanced plants will be built, if economic justification is the only consideration. The economic justification of a project should be based on what price the nation what price the nation is willing to pay when it undertakes a venture, the risk being involved with due regard to the political justification. This broadens the narrow concept of pure economical justification when undertaking an investment for developing nations.

- 22/. In the scope of implementing developmental projects a very important factor is the way of cooperation between the nations involved in the projects. The experience with Socialist countries has taught that they are not willing to undertake turnkey-projects, leaving all responsibility to the receiving country; some countries are merely interested in selling the equipment and machineries; economic and overheads are not their concern. Only with the United States, Turnkey projects can be undertaken. This certainly has its advantages as well as its disadvantages. For totally new ventures turnkey-projects are preferable; for already known technology a turnkey-project might be too expensive. . Once a new technology has been applied and introduced through a turnkey-project, it is advisable for a nation to learn as much as possible from the turnkey-project regarding the application of technology in order to tackle the problem itself for the next similar project. A turnkey-project should only be done once and should not be repeated because it is costly and educational-wise unsound.
- 23/. During the implementation of so many Development Plans, Indonesia has learned the hard course of industrial development; it cannot do the job without outside cooperation or assistance. This technical cooperation or assistance might be received in many forms; in whatever form, it is a prerequisite to speed up development. The way of international cooperation can overbridge the technological gap that exists between advanced and less developed countries which can save unnecessary large funds for their own research and development projects and most importantly can accelerate the pace of economic development in order to close the difference in the standards of living between advanced and less developed.

CHAPTER V

CONCLUDING REMARKS

- 24/. One may conclude after stocktaking of progress and assessment of experiences in industrial development programmes undertaken in Indonesia, that the application of science and technology might continuously be changed according to the direct and immediate needs under the prevailing conditions of the country. The scientific and technological development should constantly be promoted and stimulated; the application of advances in science and technology should be incorporated directly to the practical problems in the implementation of industrial projects and should be adjusted accordingly, creating thereby the stimulus to develop themselves to further progress of science and technology which can best serve the urgent needs of less developed countries.

